Michael Stephen Saxon

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Education

University of California, Santa Barbara — Santa Barbara, CA
Ph.D., Computer Science: **4.0/4.0** — 9/2020–*present*
Advisor: William Yang Wang, Ph.D.

Arizona State University — Tempe, AZ
MS., Computer Engineering: **3.9/4.0** — 8/2018–5/2020
Thesis Title—Characterizing Dysarthric Speech with Transfer Learning
Advisors: Visar Berisha, Ph.D. & Sethuraman Panchanathan, Ph.D.

Arizona State University — Tempe, AZ
BSE., Electrical Engineering; *Minor*, Mathematics: ***Magna Cum Laude*** — 8/2014–8/2018
Thesis Title—Using Goodness of Pronunciation Features for Spoken Nasality Prediction
Advisor: Visar Berisha, Ph.D.

Publications

★ Representative 🏆 Award

Preprints

P2. X. Wang, W. Chen, M. Saxon, WY. Wang, "Counterfactual Maximum Likelihood Estimation for Training Deep Networks," *Preprint* arXiv:2106.03831, Jun 2021.

P1. ★ **M. Saxon**, S. Levy, X. Wang, A. Albalak, WY. Wang, "Modeling Disclosive Transparency in NLP Application Descriptions," *Preprint* arXiv:2101.00433, Jan 2021.

Conference and Journal

C7. ★ **M. Saxon**, S. Choudhary, J. McKenna, A. Mouchtaris, "End-to-End Spoken Language Understanding for Generalized Voice Assistants," **Interspeech 2021**, Brno, CZ, Aug 2021.

C6. S. Levy, **M. Saxon**, WY. Wang, "The Truth is Out There: Investigating Conspiracy Theories in Text Generation," arXiv:2101.00379, **Findings of ACL 2021**, Online, Aug 2021.

J1. ★ **M. Saxon**, A. Tripathi, Y. Jiao, J. Liss, V. Berisha, "Robust Estimation of Hypernasality in Dysarthria," **IEEE Trans. on Audio, Speech, and Language Processing**, Vol. 28, pp 2511-2522, 2020.

C5. ★ J. McKenna*, S. Choudhary*, **M. Saxon***, G. Strimel, A. Mouchtaris, "Semantic Complexity in End-to-End Spoken Language Understanding," **Interspeech 2020**, Shanghai, CN, 2020.

C4. M. Moore, P. Papreja, **M. Saxon**, V. Berisha, S. Panchanathan, "UncommonVoice: A Crowdsourced Dataset of Dysphonic Speech," **Interspeech 2020**, Shanghai, CN, 2020.

C3. M. Moore, **M. Saxon**, H. Venkateswara, V. Berisha, S. Panchanathan, "Say what? A dataset for exploring the error patterns that two ASR engines make," **Interspeech 2019**, Graz, AT, 2019, pp. 2528-2532.

C2. **M. Saxon**, J. Liss, V. Berisha, "Objective Measures of Plosive Nasalization in Hypernasal Speech," 2019 **IEEE ICASSP 2019**, Brighton, UK, 2019, pp. 6520-6524.

C1. 🏆 T. Houghton, **M. Saxon**, Z. Song, H. Nyugen, H. Jiang and H. Yu, "2D Grating Pitch Mapping of a through Silicon Via (TSV) and Solder Ball Interconnect Region Using Laser Diffraction" **IEEE 66th Electronic Components and Technology Conference (ECTC)**, Las Vegas, NV, 2016, pp. 2222-2227. **(Texas Instruments Best Student Interactive Paper Award)**

Workshops

W4. **M. Saxon**, S. Levy, X. Wang, A. Albalak, WY. Wang, "Modeling Disclosive Transparency with GPT-2," SoCal NLP 2021 , Virtual, March 2021.

W3. **M. Saxon**, J. Liss, V. Berisha, "A new model for objective estimation of hypernasality from dysarthric speech," Workshop on Signal Analytics for Motor Speech (SAMS), Motor Speech Conference 2020, Santa Barbara, CA, February 2020.

W2. **M. Saxon***, S. Bhandari*, L. Ruskin, G. Honda, "Word Pair Convolutional Model for Happy Moment Classification," 2nd Workshop on Affective Content Analysis, AAAI 2019, Honolulu, HI, 2019, pp. 111-119. **(Workshop Oral; CL-Aff Shared task runner up, 2/47)**

W1. B. Gupta, **M. Saxon**, T. McDaniel, S. Panchanathan, "Chat-Box: Proposing a Mood Analyzer for Individuals with Social Interaction Disabilities," International Conference on Human-Computer Interaction, Las Vegas, NV, 2018, pp. 394-401.

Professional Experience

Amazon (Alexa AI Search) Manhattan Beach, CA
Applied Science Intern 6/2021–*present*
Mentors: Luca Soldaini, Eric Lind, Rik Koncel-Kedziorski, Alessandro Moschitti. End-to-end spoken QA.

Amazon (Alexa Edge ML) Pittsburgh, PA
Applied Science Intern 1/2020–8/2020
Mentors: Samridhi Choudhary, Joe McKenna, Athanasios Mouchtaris. Investigated the link between semantic complexity of datasets (entropy and graphical measures) and the performance of SOTA E2E SLU models on them [C5]. Developed a novel model stacking specialized transformer ASR and pretrained BERT model with differentiable interface for E2E SLU optimization, [C7].

Amazon (Alexa Edge ML) Pittsburgh, PA
Applied Science Intern 5/2019–8/2019
Mentors: Joe McKenna, Samridhi Choudhary, Kai Wei, Athanasios Mouchtaris. Integrated neural end-to-end spoken language understanding for intent classification for Alexa. Explored architectures for "semantic endpointing," stopping the recurrent inference once sufficient words have been heard.

Aural Analytics Scottsdale, AZ
Research Engineer Intern 12/2018–4/2019
Mentor: Shira Hahn. Integrated cloud-based ASR and developed in-house ASR models for integration in a clinical speech assessment product. Explored the design of deployable ASR systems robust to quality reduction under dysarthria.

General Dynamics Mission Systems Scottsdale, AZ
Embedded Software Engineering Intern 5/2017–7/2017
Software- and hardware-level testing for HOOK3 Combat Survival Radio, Agile issue management.

Arizona State University Engineering Tutoring Center Tempe, AZ
Tutor 9/2015–10/2016
Tutoring for homework and projects in undergraduate analog and digital circuits, electromagnetics, calculus, discrete math, C++, algorithms, differential equations, microprocessor design, and physics.

Research Interests

Natural language processing; dataset analysis; ethics and transparency in AI; end-to-end spoken language understanding; representation and transfer learning; semi-supervised learning; dysarthric speech

Skills

Software Proficiencies

Python (Pytorch, HuggingFace, Numpy, SciPy, AllenNLP), BASH, Apache Spark, C/C++, OpenCV, Kaldi, MATLAB, Linux, Verilog

Conceptual

Deep learning, pattern matching, natural language processing (NLP), automatic speech recognition (ASR), digital signal processing (DSP), embedded programming, multimedia processing, sensor fusion

Selected Graduate Coursework

Probability; information theory; speech processing, recognition, compression; neural computer vision; image compression and processing; syntax; semantics; spectral graph theory and computation; statistical machine learning

Service

Reviewer, IEEE ICASSP	2020
Reviewer, IEEE GlobalSIP	2019
Mentor, FIRST Robotics Team 2478 (Westwood Robotics), Mesa, AZ	2014–2016

Honors

National Science Foundation *Graduate Research Fellowship* (NSF GRFP)	2020
IEEE Eta Kappa Nu (HKN) *Inductee*	2015
Boy Scouts of America *Eagle Scout Award*	2011